

REMARKS

Claims 1-4, 10, 14-16 and 19-22 are pending in this application. By this Amendment, claims 19-22 are added. Support for the new claims may be found, for example in the specification at page 5 and Tables 1-4. No new matter is added.

In view of the following remarks, reconsideration and allowance of the claims are respectfully requested.

I. Rejection Under 35 U.S.C. §102/§103

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §102(e) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent Application Publication No. 2002/0192552 to Lampe-Onnerud et al. ("Lampe-Onnerud"). Applicants respectfully traverse the rejection.

Claim 1 recites, *inter alia*, "A positive electrode material powder for a lithium secondary battery containing a Li-Ni-Co-Ba-O system component as a main component ... wherein the amount of Ba in the system component is 0.0005 to 0.007 mol ratio; wherein the amorphous phase of the oxide contains at least one element selected from the group consisting of Na, K, Si, P and Al; and wherein the amount of the amorphous phase of the oxide is less than 0.01 mol ratio but more than 0." Applicants respectfully assert that Lampe-Onnerud does not anticipate, and would not have rendered obvious, at least the above features of claim 1.

The Office Action asserts that Lampe-Onnerud discloses a material for use as a cathode material in a lithium battery where the coating, and optionally the core of the material, can be a material having a formula of $\text{Li}_{x1}\text{A}_{x2}\text{Ni}_{1-y1-z1}\text{Co}_{y1}\text{B}_{z1}\text{O}_a$ wherein $x2$ and $z1$ each is greater than about 0 and equal to or less than 0.2, "A" can be selected to be Ba, and "B" can be selected to be Al.

As previously argued, Lampe-Onnerud fails to anticipate the positive electrode material powder of claim 1. As acknowledged by the Office Action, Lampe-Onnerud does not specifically disclose a material comprising both Ba and Al. Rather, Lampe-Onnerud discloses a general formula that may include Ba and Al, among many other components. Therefore, in order for the claimed positive electrode material powder to be anticipated by the disclosed formula, the claimed positive electrode material powder must be "at once envisaged" from the generic formula. See MPEP §2131.02. As previously asserted, Lampe-Onnerud discloses that "A is at least one element selected from" four possibilities, and that "B is at least one element selected from" seven possibilities. See Lampe-Onnerud, Abstract (emphasis added). Therefore, the total number of combinations encompassed by this disclosure is 1,905. This number is well above the 20 possibilities that the courts have determined would be "at once envisaged" by one of ordinary skill in the art. See MPEP §2131.02. Applicants respectfully assert that one of ordinary skill in the art would not have "at once envisaged" the specific compound comprising only Ba as "A" and only Al as "B," as asserted by the Office Action.

In further support of the above assertion, the Office Action, on page 16, asserts that claim 1 is "unlimited and compositionally undefined." However, claim 1 only requires Na, K, Si, P and/or Al in addition to Li-Ni-Co-Ba-O main component. Put differently, claim 1 only requires the use of at least one component selected from a group of five. Thus, if claim 1 "unlimited and compositionally undefined," the disclosure of Lampe-Onnerud must also have an unlimited number of possibilities and, thus, would not have "at once been envisaged" by one of ordinary skill in the art. Therefore, Applicants respectfully assert that Lampe-Onnerud does not anticipate each and every feature of claim 1.

In response to the assertion that Lampe-Onnerud would have rendered the claimed positive electrode material powder obvious, Applicants respectfully maintain their assertion

that the data provided in Tables 1-4 of the specification provide results that would not have been expected by one of ordinary skill in the art. The Office Action asserts that the evidence provided in Tables 1-4 is not commensurate in scope with the claims. Particularly, the Office Action asserts that the compositions in Tables 1-4 of the specification "include WELL-DEFINED molar amounts which are not currently claimed in the claims in question. Thus, those compositions are not commensurate in scope with the presently claimed positive electrode material." Office Action, page 16 (emphasis in original). Applicants respectfully assert that the evidence provided in Tables 1-4 of the specification show unexpected results that are commensurate in scope with the claims.

The evidence provided in Tables 1-4 clearly show improved and unexpected results in the performance of an electrode material powder that comprises both Ba and one of the five elements recited in claim 1 (i.e., Na, K, Si, P and Al), in amounts recited in claim 1, when compared to a positive electrode material powder that comprises Ba but not one of the five other elements, or a positive electrode material powder that does not comprise either Ba or one of the five other elements. Examples 1-19 of the specification show various compositions that fall within the claimed compositions. Further, Comparative Examples 1-3 show similar compositions (i.e., similar amounts of Li, Ni and Co) either without Na, K, Si, P and Al or without Na, K, Si, P, Al and Ba. As can be seen from a comparison between Examples 1-19 and Comparative Examples 1-3, the 1st charge/discharge efficiency, Rate Performance, Cycle Performance and Nail penetration test (when performed) results are improved in Examples 1-19 when compared to Comparative Examples 1-3.

This evidence shows that, given similar compositions, the claimed combination of Ba and Na, K, Si, P and/or Al, in the ranges recited in claim 1, provide improved and unexpected results over similar compositions that do not have both Ba and either Na, K, Si, P or Al. Because the amount of Ba and either Na, K, Si, P and/or Al recited in the claims provide

improved results when similar amounts of Li, Ni and Co are present, these results clearly show the effectiveness of the amounts of Ba and either Na, K, Si, P and/or Al recited in the claims. Applicants assert that the evidence in Tables 1-4 are commensurate in scope with the amounts of both Ba and either Na, K, Si, P and/or Al recited in claim 1, and that no more is required to show that amount of Ba and either Na, K, Si, P and Al as recited in claim 1 provide improved and unexpected results that rebut the Office Action's alleged showing of *prima facie* obviousness.

Additionally, Applicants respectfully assert that new claims 19-22 recite features that are even more clearly encompassed by the examples provided in the specification. Thus, the examples provided in the specification are clearly commensurate in scope with at least claims 19-22, and provide evidence of improved and unexpected results over positive electrode material powder that does not have the claimed amounts of Ba and/or Al recited in claims 19-22.

Further, as to the Office Action's assertion, on page 22, that Tables 2 and 3 of the specification do not represent an amorphous phase of an oxide because O is not explicitly listed in the tables, Applicants respectfully assert that all the examples in Tables 1-4 are oxides and that O was merely omitted from the tables because the amount of oxygen is not specifically limited. See specification, page 5. The clear majority of specification recites the importance of having amorphous oxides present in the positive electrode material powder and, thus, the examples would necessarily require this feature. Applicants respectfully request that the Office specifically address the arguments presented below, which were previously presented in the Request for Reconsideration filed on November 13, 2008, in support of the assertion that the examples in Tables 1-4 of the specification must include oxides.

The specification recites, "The amount of an amorphous phase of an oxide is set to below 0.01 mol. However, zero is not included. ... It is necessary for an amorphous phase of an oxide to be present within a particle of a material powder of the present invention or at the surface thereof. Accordingly, zero is not included." Specification, pages 9-10, carryover paragraph. This portion of the specification clearly indicates that an amorphous phase of an oxide is "necessary," and thus, it would be contrary to the disclosure of the specification to formulate examples that do not include this "necessary" amorphous phase of an oxide.

Further, the specification clearly recites that elements such as Li, Na, K, Si, Ba, B, P, and Al are elements that produce an amorphous phase of an oxide. See specification, page 8, first full paragraph. When describing how the amorphous phase of an oxide is formed, the specification recites, "[A] component for forming an amorphous phase of an oxide composed of one or plural elements selected from the group consisting of Li, Na, K, Si, Ba, B, P, and Al is mixed at an extremely small amount of below 0.01 mol. into a Li-Ni-Co-O or Li-Ni-Co-Ba-O system raw material. Firing the resulting mixture allows production of a positive electrode material for a lithium secondary battery having an amorphous phase of an oxide within each of particles." Specification, page 10, first full paragraph. Furthermore, the specification recites that Examples 1-10 and 17-19 were made by adding Ni and Co sources, with the claimed molar ratios, together with other raw materials, such as: $\text{LiOH}^+\text{H}_2\text{O}$ as the Li source; NaNO_3 as the Na source; KNO_3 as the K source; $\text{Ba}(\text{NO}_3)_2$ as the Ba source; H_3BO_3 as the B source; Al_2O_3 as the Al source; SiO_2 as the Si source; and P_2O_5 as the P source. These components are then fired and cooled. See specification pages 12-13. Thus, the preparation of these Examples includes the elements that produce an amorphous phase of an oxide, and the process (i.e., firing and cooling) that is disclosed as producing the amorphous phase of an oxide is used to produce the examples. Therefore, one of ordinary skill in the art would have

known that an amorphous phase of an oxide is inherently included in the results recorded in the Tables for the examples, even if not explicitly stated.

Additionally, regarding Examples 11-16, the specification recites, "In Examples 11, 13, 14, and 15, an amorphous phase of an oxide is formed on the surface of each of particles. In Examples 12 and 16, an amorphous phase of an oxide is formed within each of particles and on the surface thereof. Table 3 shows the respective average particle diameters and molar ratios of the individual elements measured by laser diffraction and chemical analysis, respectively." Specification, page 18. Accordingly, one of ordinary skill in the art would have known that an amorphous phase of an oxide is inherently included in the results recorded in the Tables for these Examples, even if not explicitly stated. Therefore, Applicants respectfully assert that Tables 1-4 are all directed to oxides and clearly show improved and unexpected results that rebut the Office Action's alleged *prima facie* showing of obviousness.

Lampe-Onnerud does not anticipate, and would not have rendered obvious claim 1. Claims 3-4, 10 and 14-16 variously depend from claim 1 and, thus, also are not anticipated by and would not have been rendered obvious by Lampe-Onnerud. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejection Under 35 U.S.C. §103

A. Yasuda, JP '277 and AAPA

The Office Action rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over EP 0 849 817 to Yasuda ("Yasuda") in view of Applicants' Alleged Admission of Prior Art (hereinafter "AAPA") and rejects claims 1-4, 10 and 14-16 under 35 U.S.C. §103(a) over JP 06-275277 ("JP '277") in view of AAPA. Applicants respectfully traverse the rejections.

The Office Action, on page 7, acknowledges that Yasuda "neither explicitly discloses the Ba component nor the specific amount of the amorphous phase." The Office Action further acknowledges, on page 11, that JP '277 "neither explicitly discloses the Ba component

nor the specific amount of the amorphous phase." Thus, the Office Action acknowledges that neither Yasuda nor JP '277 disclose the Ba component as recited in claim 1.

To allegedly address the discrepancies of both Yasuda and JP '277, the Office Action applies the disclosure of AAPA. The Office Action asserts that AAPA presents different publications disclosing positive electrode materials for lithium secondary batteries with Li-Ni-Co-O or Li-Ni-Co-Ba-O system compositions, and that Ba may be present in the range from 0 to 0.01. See Office Action, pages 7 and 11. The Office Action therefore asserts that it would have been obvious to have combined the disclosures of Yasuda and JP '277 with the AAPA to yield the composition of the electrode material as recited in claim 1. Applicants respectfully disagree.

First, Applicants respectfully assert that the examples in Tables 1-4 of the specification provide improved and unexpected results that are commensurate in scope with the claims for at least the reasons argued above, which are incorporated herein in thier entirety. Thus, Applicants assert that the evidence provided in Tables 1-4 of the specification provide sufficient evidence of improved and unexpected to rebut the Office Action's alleged *prima facie* showing of obviousness. Further, as stated above, Applicants assert that new claims 19-22 are even more clearly commensurate in scope with the evidence provided in Tables 1-4 of the specification and, thus, at least they would not have been rendered obvious by the applied references.

Second, as stated above, the Office Action relies on the disclosure of the AAPA as allegedly disclosing that Ba can be used in an electrode material powder. However, Applicants assert that the Office Action impermissibly uses the Applicants' own specification against Applicants to provide a reason or rationale for one of ordinary skill in the art to have combined the AAPA and either JP '277 or Yasuda. Applicants again assert that the disclosure beginning at the "Summary of the Invention" section on page 3 of the specification ends the

AAPA and begins Applicants' disclosure of their invention. Thus, any portion of Applicants' specification after the "Summary of the Invention" on page 3 is not part of the AAPA or any other prior art, it is Applicants disclosure of their invention that cannot be used against them in a rejection. Thus, it is *per se* improper for the Office Action to cite any portion of the specification after the "Summary of the Invention" as providing a reason or rationale for combining references. However, the Office Action does exactly this.

The Office Action repeatedly asserts that "[b]y compounding the teachings of the prior art, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to add the Ba component of the AAPA to the amorphous positive electrode material of JP '277 as it is known in the art that Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's [sic] specification at page 4, last full paragraph); particularly, such arrangement allows the production of a positive electrode material of a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's specification at page 6, last full paragraph, item-3). Thus, the addition of Ba to the amorphous material of the JP '277 enhances the amorphousness of that material." Office Action, pages 12-13.

Pages 4 and 6 of Applicants' specification are not prior art, and were never admitted as being prior art. The recitations on pages 4 and 6 of the specification are the Applicants' own findings and, thus, cannot be used against Applicants as prior art. Other than the recitations on pages 4 and 6 of the specification, the Office Action does not provide any reason or rationale to support that one of ordinary skill in the art would have known that Ba enhances the amorphousness of a material and, thus, one of ordinary skill in the art would not have added Ba to either JP '277 or Yasuda to increase the amorphousness of the material, as asserted in the Office Action.

Throughout prosecution, the Office Action has replied to Applicants assertion that it is using their disclosure impermissibly by asserting generalities such as "it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper." Office Action, pages 19-20. That is not the case here.

The Examiner specifically cites portions of the Applicants' specification that are not prior art (specification, pages 4 and 6) against Applicants. This is necessarily gleaned from the Applicants' disclosure, because the Office Action directly cites the Applicants' disclosure for its reasoning behind the combination of JP '277 and AAPA and Yasuda and AAPA and, as stated above, pages 4 and 6 are part of Applicants invention and are not, and were never admitted to be, prior art. Therefore, this reconstruction is not proper.

The Office Action further asserts, "where the specification identifies work done by another as 'prior art,' the subject matter so identified is treated as admitted prior art." Office Action, page 20. In response, even if the "Background" section of the specification could be considered prior art, this does not include any recitations that are not part of the "Background," such as the recitations on pages 4 and 6 that the Office Action cites against Applicants as providing a reason or rationale to have combined the AAPA and either JP '277 and Yasuda. Therefore, the use of these passages of the specification as providing rationale for the combination of JP '277 and AAPA or Yasuda and AAPA is improper

Applicants respectfully request that in reply to the above assertions, the Office Action either apply another reference that qualifies as prior art to disclose that it was known that Ba improves amorphousness or, in the alternative, specifically provide reasoning why recitations under the "Summary of the Invention" section of Applicants' specification can properly be

used against Applicants to provide a reason or rationale to have combined the AAPA with either JP '277 or Yasuda. For clarity, Applicants are not arguing whether or not JP 2001-173285 may or may not be considered prior art (although Applicants do not herein concede that it is prior art), Applicants are arguing that it is improper for the Office Action to cite pages 4 and 6 of Applicants' own specification as disclosing that Ba allows easy formation of the amorphous phase of the oxide and that it would have been obvious for one of ordinary skill in the art, in view of page 4 of Applicants' specification, to have used Ba in JP '277 or Yasuda to increase the amorphousness.

Third, regarding JP '277, Applicants maintain their assertion that JP '277's disclosure of using phosphorous in excess of 0.2 mols would not have rendered the claimed range of less than 0.01 mol ratio but more than 0 obvious. The Office Action asserts, "prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties." Office Action, page 19 (emphasis in original). However, the Office Action provides no rationale why 0.2 mols is "close enough" to 0.01 mol ratio. For example, 0.2 mols is 20 times more than 0.01 mols. Thus, if one mole is 100g, 0.01 mol would be 1g and 0.2 mols would be 20g. Applicants respectfully assert that this is not "close enough" to establish a *prima facie* case of obviousness. Particularly, Claim 1 recites a very narrow range and, thus, one of ordinary skill in the art would not have expected that one could increase the maximum of this range by a multiple of 20 without affecting the positive electrode material powder.

For at least the reasons stated above, claim 1 would not have been rendered obvious by Yasuda and AAPA, or JP '277 and AAPA, as applied in the Office Action. The remaining claims variously depend from claim 1 and likewise would not have been rendered obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. New Claims

By this Amendment, new claims 19-22 are presented. New claims 19-22 variously depend from claim 1 and, thus, distinguish over the applied references for at least the reasons discussed above with respect to claim 1, as well as for the additional features that they recite. Prompt examination and allowance of new claims 19-22 are respectfully requested.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Request for Continued Examination
Petition for Extension of Time

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